

## **REMARKS**

### **Status of the Claims**

Claims 1 – 27 are currently pending. Claim 9, 23, and 27 are presently amended to further define the invention. No new matter is introduced by the present claim amendments.

### **Rejection of Claims 9 - 17 under 35 USC 112, 2<sup>nd</sup> paragraph**

Claims 9 – 17 stand rejected as allegedly being indefinite. The Applicants respectfully disagree; however, to facilitate prosecution, Claim 9 has been amended to include the referenced description from Claim 1. Applicants respectfully request reconsideration and withdrawal of the rejection.

### **Rejection of Claims 1 – 12, 14 – 17, and 19 – 27 under 35 USC 102(b)**

Claims 1 – 12, 14 – 17, and 19 – 27 stand rejected for allegedly being anticipated by Soref *et al.*, U.S. 5,548,128 (“Soref”). The Applicants respectfully disagree with the rejections.

Applicants reassert their previous discussion from the preceding “Response to the Office Action Mailed June 16, 2006,” and provide the following supplemental discussion.

#### **1. Independent Claims 1, 9, 19, and 27**

##### **a. The Office continues to misinterpret the teaching of Soref.**

Each of the independent claims presently relate to either alloys of SiGeSn, structures comprising an “essentially single-phase” SiGeSn layer, or methods for preparing the same. Applicants had previously argued that Soref does not disclose anything other than graded SiGeSn layers. In response to the Applicants previous arguments, the Office cited Col. 3, lines 25 – 27 in Soref, and has alleged that

*...the strained layer can be spatially varying or not spatially varying and in the embodiment wherein the strained is not spatially varying applicants' arguments are not persuasive.*

Applicants maintain their previous arguments and provide the following discussion.

In fact, nowhere does Soref provide any disclosure related to the use of non-spatially varying (*i.e.*, graded) SiGeSn layers of any type. For reference, the entire paragraph containing the referred citation in Soref reads,

*The strain-relieved buffer under the stack can be constructed from a spatially varying (graded) composition alloy of SiGeSn. At the Si wafer, the buffer layer 21 is Si-like. At the top surface of the buffer layer 19, the alloy is like GeSn, for example,  $Ge_{0.92}Sn_{0.08}$ . This buffer is doped n-type, for example, to provide one portion of a p-i-n diode structure. Electrical contact is made to this buffer via electrode 17.*

Applicants note that the preceding paragraph makes no mention of any other materials for the strain-relieved buffer layer other than a **graded composition**. Further, the very next paragraph states (Col. 3, lines 33 – 44; emphasis added),

*The upper buffer layer 11 can be p-doped, and the remaining intermediate layers of the stack are substantially undoped. However, the device can also be p-i-p or n-i-n if desired. **It may be difficult technically to grade the composition of the SiGeSn lower buffer** from pure silicon up to germanium-tin. In that case, two buffer layers can be grown upon the silicon substrate: for example, lower buffer layer 21 could be relaxed SiGe, with a composition that varied between pure Si and pure Ge; and lower buffer 19 would be a relaxed alloy of GeSn, whose composition varied from pure Ge to  $Ge_{sub.0.95}Sn_{sub.0.05}$ . Both lower buffers could be doped n-type*

We note that nowhere does Soref discuss an “essentially single phase” layer or alloy as presently claimed. In fact, in noting that the graded SiGeSn layer may be difficult to prepare, instead of suggesting the use of an essentially single phase SiGeSn layer, Soref suggests the use to *two separate buffer layers* – neither of which is an essentially single phase SiGeSn layer or a SiGeSn alloy.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (emphasis in original). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’ ” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999), **MPEP 2112 (IV)**.

As the discussion in Soref is limited to only graded SiGeSn layers or two separate buffer layers of SiGe and GeSn, Soref lacks any extrinsic evidence to make clear that the missing descriptive matter (*i.e.*, a non-graded SiGeSn layer) is necessarily present in the reference. In fact, it would be recognized by one skilled in the art that Soref requires that the allegedly anticipating “buffer layer” either homogeneously (a graded SiGeSn layer) or step-wise (SiGe and GeSn) vary across its thickness.

Applicants submit that Soref does not explicitly or implicitly disclose an essentially single phase SiGeSn layer as presently claimed in Claims 1 and 9; and Soref does not explicitly or implicitly disclose a SiGeSn alloy as claimed in Claims 19 and 27.

**b. Soref is not enabling for an essentially single phase SiGeSn layer.**

“In determining that quantum of prior art disclosure which is necessary to declare an applicant’s invention ‘not novel’ or ‘anticipated’ within section 102, the stated test is whether a reference contains an ‘enabling disclosure’... .” *In re Hoeksema*, 399 F.2d 269, 158 USPQ 596 (CCPA 1968). The disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation. *Elan Pharm., Inc. v. Mayo Found. For Med. Educ. & Research*, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003). **MPEP 2121.01.**

Where a process for making the compound is not developed until after the date of invention, the mere naming of a compound in a reference, without more, cannot constitute a description of the compound. *In re Hoeksema*, 399 F.2d 269, 158 USPQ 596 (CCPA 1968). **MPEP 2121.02(I).**

While Applicants maintain that the “essentially single phase” SiGeSn layer and SiGeSn alloys of the instant claims are not explicitly or inherently described in Soref, even *if* they were, Soref is not enabling for such compositions. As stated in the present specification, at the time of filing, the presently claimed SiGeSn compositions were experimentally unknown and their properties only had been investigated by theoretical means (see, Specification, paragraph [0007]). The instant application describes for the first time, a method for preparing such a SiGeSn compositions (see, Specification, [0010]).

In particular, the only synthetic methods mentioned in Soref are chemical vapor deposition (CVD) and molecular beam epitaxy (MBE) (see, Col. 2, lines 11 – 19). However, the discussion at Col. 2, lines 11 – 19 is only related to GeSn layers (e.g., Col. 2, lines 18 – 20, “...thus the GeSn growth is expected to be quite feasible.”). Soref does not prove any methods for preparing the SiGeSn compositions, and in fact, notes at Col. 3, lines 36 - 38 (emphasis added), “***It may be difficult technically to grade the composition of the SiGeSn lower buffer from pure silicon up to germanium-tin.***”

In contrast, as stated in the instant application, the instantly claimed SiGeSn materials were prepared according to a UHV-CVD process based on precursor CVD and “**cannot be created by conventional CVD and MBE routes**” (see, Specification, [0010]). Therefore, at the time of filing the instant application, one skilled in the art, given the Soref reference, would require undue experimentation to prepare the instantly claimed SiGeSn compositions, as evidenced by the substantial lack of known methods for preparing the same in the art. As Soref is not enabled for any method for preparing the instantly claimed essentially single phase SiGeSn layers and SiGeSn alloys, Soref cannot anticipate Claims 1, 9, 19, or 27.

**c. The Office has misinterpreted the instant application.**

In response to the Applicants' previous arguments, the Office further cited paragraph [0032] of the instant application in a statement on page 7 of the present action as follows,

*Further Applicants' specification para 0032 states ( in relevant parts )  
 "materials like Si-ge-Sn alloys are chosen because they form highly uniform layers , all of which make it clear to one of ordinary skill in the art , that Soren [sic] also discloses its layer to be highly uniform i.e. consists elemental uniformity of material that is consistent with single phase alloy layer....*

Applicants submit that paragraph [0032] of the instant specification has nothing to do with the Si-Sn-Ge layer or alloy, rather it is wholly concerned with the **Ge<sub>1-x</sub>Sn<sub>x</sub> buffer layer** (note the comparisons to the SiGeSn layer in the final sentence). Paragraph [0032] of the instant specification reads, in whole (emphasis added),

*We initially investigated the growth of Si<sub>1-x-y</sub>Ge<sub>x</sub>Sn<sub>y</sub> directly on Si(100) using Ge<sub>1-x</sub>Sn<sub>x</sub> (x=2-4 at. %) buffer layers. We chose **Ge<sub>1-x</sub>Sn<sub>x</sub> alloys** as buffer layers because they possess crystallographic, morphological and mechanical*

*properties that make them uniquely suitable for use as templates on Si substrates. **These materials** grow as highly uniform, strain-free layers with smooth and continuous surface morphologies (typical AFM rms values are 0.5 and 1.4 nm) and display extremely low concentrations of threading defects, particularly those that extend to the uppermost surface (the quality of pure Ge films grown on Si by similar methods is much worse). In addition, they are high compressibility (softer) solids compared to either Si and  $\text{Si}_{1-x-y}\text{Ge}_x\text{Sn}_y$  and thereby can act as potential spacers that can conform structurally and readily absorb the differential strain imposed by the more rigid Si and Si-Ge-Sn.*

In fact, Applicants cannot find any statement in the instant specification which contains, "materials like Si-Ge-Sn alloys are chosen because they form highly uniform layer..." as alleged and quoted by the Office in the present action.

## **2. Dependent Claims**

Applicants make the following observations regarding deficiencies in the disclosure of Soref with respect to the dependent claims. In combination with the preceding discussion of the deficiencies in the rejection of the independent claims, Applicants submit the rejections each of dependent claims are improper for failing to anticipate all the claimed limitations.

### **a. Dependent Claims 4 - 6, 14 - 16, and 20 - 22**

The Office has alleged that claims 4 - 6 are anticipated by Soref, and cited Col. 2, line 39; Col. 2, lines 60 - 65; Col. 3, lines 29 and 44; the abstract, and Claim 16 therein. Claims 4 - 6 are dependent on Claim 1, and are directed to semiconductor structures comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer with further limitations related to variables 'x', 'y', and 'z'.

The Office has alleged that claims 14 - 16 are anticipated by Soref, and cited the same passages as for claims 4 - 6. Claims 14 - 16 are dependent on Claim 9, and are directed to methods to prepare a semiconductor structure comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer with the further limitations related to variables 'x', 'y', and 'z'.

The Office has alleged that claims 20 - 22 are anticipated by Soref, and cited the same passages as for claims 4 - 6. Claims 20 - 22 are dependent on Claim 19, and are directed to alloys of the formula,  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ , with further limitations related to variables 'x' and 'y'.

With respect to the passages cited in Soref by the Office, Applicants note that Col. 2, line 39 is related only to GeSn barriers ( $\text{Ge}_{0.85}\text{Sn}_{0.15}$ ; *i.e.*,  $z = 0.15$ ); Col. 2, lines 60 - 65 is related only to GeSn quantum wells (see, Col. 2, lines 45 - 47); Col. 3, line 29 is related only to GeSn barriers ( $\text{Ge}_{0.92}\text{Sn}_{0.08}$ ; *i.e.*,  $z = 0.08$ ); and Col. 3, line 44 is related only to GeSn barriers ( $\text{Ge}_{0.95}\text{Sn}_{0.05}$ ; *i.e.*,  $z = 0.05$ ). Thus, none of these citations relied upon by the Office for establishing that Soref anticipates the present dependent claims provides any teaching whatsoever regarding essentially single phase SiGeSn, nor any of the specific limitations recited in the dependent claims. Therefore, this passage in Soref does not cure the lack of a disclosure of the instantly claimed essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer, methods for their preparation, or SiGeSn alloys.

For the sake of completeness, we review each rejection in turn:

**b. Dependent Claims 7 – 8**

The Office has alleged that claims 7 - 8 are anticipated by Soref, and cited the Abstract therein. Claims 7 - 8 are dependent on Claim 1, and are directed to semiconductor structures comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer with the further limitations that the  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer is strained (Claim 7) or relaxed (Claim 8). Applicants note that the abstract only mentions that the SiGeSn layer relaxed **and** graded (see Abstract, lines 8 – 12) and is silent with respect to strained SiGeSn layers.

**c. Dependent Claim 10**

The Office has alleged that claim 10 is anticipated by Soref, and cited Col. 2, lines 15 - 20 therein. Claim 10 is dependent on Claim 9, and is directed to a method to prepare a semiconductor structure comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer with the further limitation that the  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer is deposited by precursor chemical vapor deposition, wherein the precursor chemical vapor comprises  $\text{SnD}_4$  and  $\text{H}_3\text{SiGeH}_3$ .

As discussed previously, Col. 2, lines 15 - 20 is only related to GeSn layers (e.g., Col. 2, lines 18 – 20, “...thus the GeSn growth is expected to be quite feasible.”).

**d. Dependent Claim 11**

The Office has alleged that claim 11 is anticipated by Soref, and cited Col. 2 therein. Claim 11 is dependent on Claim 9, and is directed to a method to prepare a semiconductor

structure comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer with the further limitation that the  $\text{Sn}_z\text{Ge}_{1-z}$  layer is deposited by precursor chemical vapor deposition, wherein the precursor chemical vapor comprises  $\text{SnD}_4$  and  $\text{Ge}_2\text{H}_6$ .

However, the discussion at Col. 2, lines 11 – 19 is only related to GeSn layers (*e.g.*, Col. 2, lines 18 – 20, “...thus the GeSn growth is expected to be quite feasible.”), and does not cure the lack of a disclosure of the instantly claimed essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer.

#### **e. Dependent Claim 25**

The Office has alleged that claim 25 is anticipated by Soref, and cited the Examples therein. Claim 25 is dependent on Claim 1, and is directed to a semiconductor structure comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer with the further limitation that the  $\text{Sn}_z\text{Ge}_{1-z}$  and  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layers are lattice-matched. As Soref does not describe any method to prepare the instantly claimed SiGeSn layers (*supra*), it necessarily cannot, and does not, describe layers such that the SnGe and SiGeSn layers are lattice matched.

For the preceding reasons, Applicants submit the rejection of the instant claims over 35 USC 102(b) is improper. In particular, the Office has failed to properly construe the teachings of Soref as would be understood by one skilled in the art; the Office has improperly cited a reference which does not describe the presently claimed SiGeSn layer in such a way to enable one skilled in the art to prepare the same; and the Office has misinterpreted the present Specification in an attempt to cite the Applicant’s own application against themselves. The Applicants respectfully request reconsideration and withdrawal of the rejection.

#### **Rejection of Claims 3, 13, and 18 under 35 USC 102(b)**

Claims 3, 13, and 18 stand rejected for allegedly being anticipated by Fieselmann, U.S. 4,777,023 (“Fieselmann”). We respectfully disagree with the rejections.

Applicants reassert their previous discussion from the preceding “Response to the Office Action Mailed June 16, 2006,” and provide the following supplemental discussion.

#### **1. Independent Claim 3**

##### **a. Fieselmann does not teach the compound $\text{H}_3\text{SiO}_3\text{SCF}_3$ .**

Claim 3 presently reads,

3. (Original) A method for synthesizing a compound having the molecular formula  $H_3Si-GeH_3$ , the method comprising combining  $H_3SiO_3SCF_3$  with  $KGeH_3$  under conditions whereby  $H_3Si-GeH_3$  is obtained.

The Office has alleged that Fieselmann anticipates the compound,  $H_3SiO_3SCF_3$ , through the recitation at Column 2, Lines 37-46 (emphasis added),

*To achieve the objects, and in accordance with the purpose of the invention, as embodied and broadly described herein, the invention comprises a method for preparing a hydride containing at least two different Group 4A atoms wherein at least one of the Group 4A atoms is silicon or germanium, comprising the steps of: (a) reacting an alkali metal and a macrocyclic compound with a silicon or germanium hydride to form a salt; and (b) reacting the salt formed in step (a) with a halide containing a different Group 4A atom.*

“A halide” is not explicitly defined in Fieselmann, rather only examples of halides are provided, see Column 5, Line 35 – 39 (emphasis added),

*A wide variety of halides containing a different Group 4A atom can be used in practicing step (b) of the present invention. Good results have been obtained using  $CH_3I$ ,  $CH_2Cl_2$ , or  $SiH_3Cl$  as the halide containing a different Group 4A atom.*

The term “halide” as used in Fieselmann clearly is a generic term encompassing a multitude of species, and, as such, **cannot** anticipate the specific species ( $H_3SiO_3SCF_3$ ) of claim 3. MPEP 2131.02 states,

*If one of ordinary skill in the art is able to “at once envisage” the specific compound within the generic chemical formula, the compound is anticipated. One of ordinary skill in the art must be able to draw the structural formula or write the name of each of the compounds included in the generic formula before any of the compounds can be “at once envisaged.” One may look to the preferred embodiments to determine which compounds can be anticipated. In re Petering, 301 F.2d 676, 133 USPQ 275 (CCPA 1962)....In re Petering, the prior art disclosed a generic chemical formula [...] The court held that this formula, without more, could not anticipate a claim to 7-methyl-9-[d, l'-ribityl]-isoalloxazine because the generic formula encompassed a vast number and perhaps even an infinite number of compounds. However, the reference also disclosed preferred substituents for X, Y, Z, R, and R' as follows: where X, P, and R' are hydrogen, where Y and Z may be hydrogen or methyl, and where R is one of eight specific isoalloxazines.*

In the instant case, none of the specific examples (*e.g.*, CH<sub>3</sub>I, CH<sub>2</sub>Cl<sub>2</sub>, and SiH<sub>3</sub>Cl) or preferred embodiments, themselves generic terms, (*e.g.*, “silicon or germanium halide” at Col. 2, line 54; and “organic halide” at Col. 2, line 64) in Fieselmann would lead one skilled in the art to envision the presently claimed species (H<sub>3</sub>SiO<sub>3</sub>SCF<sub>3</sub>).

**b. The Office continues to misinterpret the term “halide” in Fieselmann.**

In response to the Applicant’s previous arguments, the Office states in the paragraph bridging pages 7 and 8 of the instant action,

*However Applicants' position can be persuasive because If Soren [sic] reference meant only a halide and should be limited to halogens only (Flouride, chloride, bromide or iodide) then it was not necessary for Soren to mention a compound containing a halide component in a different 4a group atom (emphasis supplied).*

In the preceding quote, the Applicants assume the Office means “a Group 4a compound containing a halide.” The Office did not supply any citation to Fieselmann to support the alleged description. No where does Fieselmann describe “a compound containing a halide,” instead, throughout the item is merely referred to as “a halide containing..” or “the halide containing...”.

Fieselmann only defines “the halide containing a different Group 4A atom” by way of examples, at Col. 5, lines 35 – 39 (emphasis added),

*A wide variety of halides containing a different Group 4A atom can be used in practicing step (b) of the present invention. Good results have been obtained using CH<sub>3</sub>I, CH<sub>2</sub>Cl<sub>2</sub>, or SiH<sub>3</sub>Cl as the halide containing a different Group 4A atom.*

Therefore, to properly define the term “halide” one must look at the “plain meaning” to one skilled in the art unless such meaning is inconsistent with the specification. **MPEP 2111.01.**

“Plain meaning” refers to the ordinary and customary meaning given to the term by those of ordinary skill in the art. The ordinary and customary meaning of a term may be evidenced by a variety of sources, including the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art. “Where there are several common meanings for a claim term, the patent disclosure serves to point away from the improper meanings and toward the proper meanings.” *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250, 48 USPQ2d 1117, 1122 (Fed. Cir. 1998). If more than one extrinsic definition

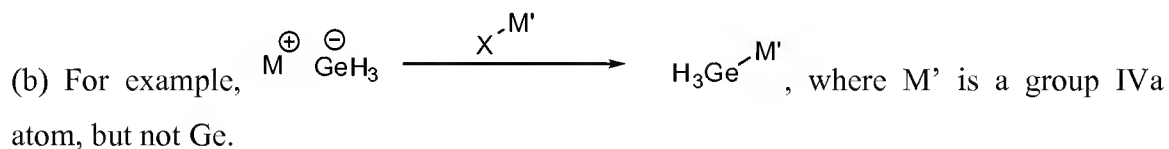
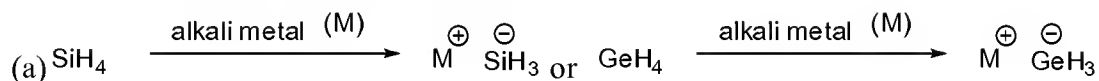
is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all consistent meanings. See e.g., *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001). “[W]ords in patent claims are given their ordinary meaning in the usage of the field of the invention, unless the text of the patent makes clear that a word was used with a special meaning. *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999) **MPEP 2111.01(II)**. The meaning of a particular claim term may be defined by implication, that is, according to the usage of the term in the context in the specification. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) (*en banc*); and *Vitronics Corp. v. Conceptronic Inc.*, 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996). **MPEP 2111.01(III)**.

Fieselmann teaches a method for preparing “a hydride containing at least two different Group 4A atoms wherein at least one of the Group 4A atoms is silicon or germanium,” comprising reacting

(a) the alkali salt of a silicon or germanium hydride; with

(b) a halide containing a different Group 4A atom.

That is, Fleischmann describes the following:



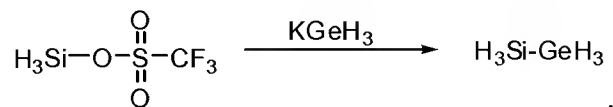
Fieselmann teaches the following specific examples:



“The halide” in Fieselmann is clearly not any “compound containing a halide” as alleged by the office. Applicants note that in each and every case described in Fieselmann, the halide is bound to the “Group 4A atom” to which the silyl or germyl group is subsequently bound by the reaction.

It is clear that “the halide” is acting as a “leaving group” in the reaction. Such is consistent with the exemplified “halides” at Col. 5, lines 35 – 39, and Example 2 – 5. Therefore, the term “halides” in Fieselmann, to one skilled in the art, merely means compounds containing a halogen atom where the halogen atom itself is (a) displaced by the nucleophile; **and** (b) bonded to the Group 4a atom which forms the new chemical bond to the silyl or germyl nucleophile.

In contrast, the instantly rejected claims generally describe the following reaction,



and note that the germyl anion displaces the trifluoromethylsulfonyl (triflate) group. All halogen atoms therein are bound to a carbon atom which is part of the triflate group. As is clear from the instant specification, the reaction occurs at the Si atom and not the carbon atom.

Applicants submit that while the reactant in Claim 3 ( $\text{H}_3\text{SiO}_3\text{SCF}_3$ ) contains fluoro groups, the claimed compound does not fall under the definition of the term “halide” as used in Fieselmann, and as would be understood by one skilled in the art for the following reasons,

- (i) fluoro groups are known to not be good leaving groups as known to one skilled in the art, and are not, themselves, displaced by the silyl or germyl anion; rather the entire triflyl group is displaced; and
- (ii) the newly formed chemical bond in the claimed reaction is formed between the germyl group and the Si atom, not the carbon atom to which the fluoro groups are attached.

## **2. Dependent claims**

### **a. Dependent claim 13**

The Office has alleged that claim 18 is anticipated by Fieselmann, and cited the Examples therein. Claim 13 is dependent method claim of Claim 9, and is directed to a method to prepare a semiconductor structure comprising: a substrate, a  $\text{Sn}_z\text{Ge}_{1-z}$  layer formed over the substrate, and an essentially single-phase  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer formed over the  $\text{Sn}_z\text{Ge}_{1-z}$  layer, further comprising the step of annealing the  $\text{Sn}_z\text{Ge}_{1-z}$  layer prior to depositing the  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer.

Nowhere does Fieselmann discuss depositing a  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  layer over a  $\text{Sn}_z\text{Ge}_{1-z}$  layer (Claim 9), nor does Fieselmann discuss annealing the  $\text{Sn}_z\text{Ge}_{1-z}$  before depositing the

Ge<sub>1-x-y</sub>Si<sub>x</sub>Sn<sub>y</sub> layer (Claim 13). The only discussion on Fieselmann regarding preparing a semiconductor structure is Example 7 which is concerned with the proposed preparation of a SiGe layer i-layer in a p-i-n junction (Col. 8, lines 59 – 64, referencing Figure 1). Applicants submit the rejection of claim 13 under 35 USC 102(b) is improper for failing to anticipate all the claimed limitations.

**b. Dependent claim 18**

The Office has alleged that claim 18 is anticipated by Fieselmann, and cited Example 3 therein. Claim 18 is dependent method claim of Claim 3, and is directed to a method for synthesizing a compound having the molecular formula H<sub>3</sub>Si-GeH<sub>3</sub>, with the further limitation that the reaction occurs at about -60 °C . Applicants note that only Example 2 in Fieselmann is concerned with the preparation of H<sub>3</sub>Si-GeH<sub>3</sub>. Example 3 is concerned with the preparation of H<sub>3</sub>Si-CH<sub>3</sub>.

Nowhere does Fieselmann describe a method for preparing H<sub>3</sub>Si-GeH<sub>3</sub> where the reaction occurs at about -60 °C, as claimed. Preferred temperatures for the reaction in Fieselmann are described at Col. 5, lines 50 – 62, a range from -100 °C to 0 °C. The examples in Fieselmann use methods where reactants are mixed at

(a) liquid nitrogen temperatures (77 K; -196 °C) and warmed to room temperature (~ 25 °C) [Examples 2, 4, and 5]; or

(b) -38 °C [Example 3]. Applicants submit the rejection of claim 18 under 35 USC 102(b) is improper for failing to anticipate all the claimed limitations.

For the preceding reasons, Applicants submit the rejections of claims 3, 13, and 18 under 35 USC 102(b) are improper. In particular, the Office has failed to properly construct the teachings of Fieselmann as would be understood by one skilled in the art; and the Office has improperly cited a reference which does not describe the present claims. The Applicants respectfully request reconsideration and withdrawal of the rejection.

## **CONCLUSION**

Applicants respectfully submit that all requirements of patentability have been met. Allowance of the claims and passage of the case to issue are therefore respectfully solicited.

If the Examiner has any questions or comments regarding this Amendment, they are encouraged to contact the undersigned as indicated below.

Respectfully submitted,

Date: May 7, 2007

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